4.2 Distributing Operations

In this problem, you will compute areas of rectangles using different expressions. Look for ways to rewrite an expression into an equivalent expression that is easier to compute.

Problem 4.2 Distributing Operations

A. Richard lives in a neighborhood with a rectangular field. Each part below shows a way to divide the field for different kinds of sports.

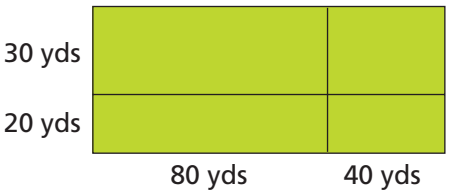
1. Find the area.

2. The field is divided into two parts.

a. Find the area of each part.

b. Write a number sentence that shows that the sum of the smaller areas is equal to the area of the entire field.

3. The field is divided into four parts.

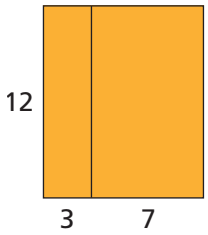


a. Find the area of each part.

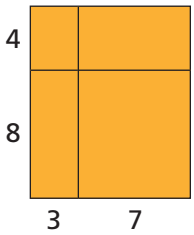
b. Write a number sentence that shows that the sum of the smaller areas is equal to the area of the entire field.

B. Use what you learned in Question A. Write two different expressions to find the area of each rectangle. Tell which uses fewer operations.

1.



2.



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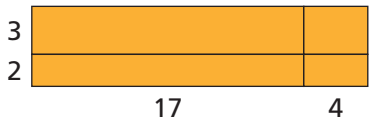
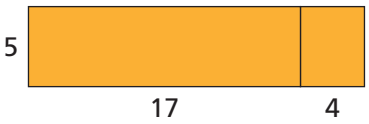


4.



C. **1.** Draw a rectangle whose area can be represented by $7 \times (11 + 9)$.

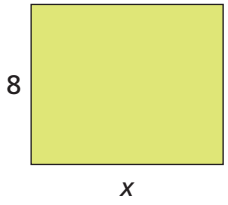
2. Write another expression for the area of the rectangle in part (1).

3. Draw a rectangle whose area can be represented by $(3 + 1) \times (3 + 4)$.

4. Write another expression for the area of the rectangle in part (3).

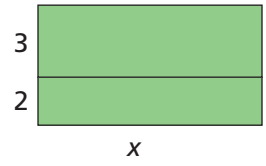
D. The unknown length in each rectangle is represented by a variable x.

1. Write an expression to represent the area of the rectangle.



2. Write two different expressions to represent the area of each rectangle below.

a.



b.

E. Find the missing part(s) to make each sentence true.

1. $12 \times (6 + 4) = (12 \times \square) + (12 \times 4)$

2. $2 \times (n + 4) = (2 \times \square) + (\square \times 4)$

3. $(n \times 5) + (n \times 3) = \square \cdot (5 + 3)$

4. $(-3 \times 5) + (\square \times 7) = -3 \cdot (\square + 7)$

5. $4n + 11n = n \cdot (\square + \square)$

ACE **Homework starts on page 69.**